

WHAT IS CLAIMED IS:

1. A polymer actuator comprising a conductive powder compact comprising a conductive polymer and a dopant, an ion donor, a work electrode, and a counter electrode, whereby it contracts or extends when
5 voltage is applied between said work electrode and said counter electrode.
2. The polymer actuator according to claim 1, wherein said conductive polymer has a conjugated structure.
3. The polymer actuator according to claim 1 or 2, wherein said
10 conductive polymer is at least one selected from the group consisting of polypyrrole, polythiophene, polyaniline, polyacetylene and their derivatives.
4. The polymer actuator according to any one of claims 1-3, wherein said ion donor contains an electrolyte.
5. The polymer actuator according to any one of claims 1-4,
15 wherein said ion donor is in the form of a solution, a sol, a gel or a combination thereof.
6. The polymer actuator according to any one of claims 1-5, wherein said ion donor contains an amphiphatic compound.
7. The polymer actuator according to any one of claims 1-6,
20 wherein said ion donor has a binder function.
8. The polymer actuator according to any one of claims 1-7, wherein said dopant has a binder function.
9. The polymer actuator according to any one of claims 1-8,
wherein said work electrode is in contact with said powder compact, and
25 wherein said counter electrode is disposed in said ion donor at a position separate from said powder compact.
10. The polymer actuator according to any one of claims 1-9, wherein said powder compact is in a planar or columnar shape.

11. The polymer actuator according to any one of claims 1-10,
wherein said conductive powder has electric resistance of $10^{-4} \Omega$ to $1 \text{ M}\Omega$.
12. The polymer actuator according to any one of claims 1-11,
wherein the amount of said conductive polymer in said conductive powder
5 is 1-99.9% by mass.
13. The polymer actuator according to any one of claims 1-12,
wherein said conductive polymer has an average particle size of 10 nm to 1
mm.